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An Index to the described Species of *Botrychium*

BY LUCIEN MARCUS UNDERWOOD

During seven years of special but more or less interrupted study of the genus *Botrychium* added to a field experience with various members of the genus extending over a quarter of a century, we have been able to see the most important collections of the world and have received a great quantity of material from numerous correspondents. Besides practically all the herbaria of this country, the foreign collections at Kew, London, Berlin, and Paris have been studied with care. As a result of this study not only have our former convictions regarding the status of the various members of the *ramosum* and *ternatum* groups been confirmed, but additional species in both these groups, together with two new representatives of the *Virginianum* group can now be properly segregated.

With the most recent publication of an African species, some members of the genus are now found on every continent and in every zone in which a land-area exists. The first index to the species was published by Milde,* who early gave an elaborate account of the variations of the species known to him. Great authority has hitherto been attributed to his opinions, which he published a generation ago, but it must ever be remembered that he based his conclusions, except among the central European species which he knew in the field, on exceedingly meagre data. This is especially true of American material, particularly among the smaller species of the genus. The same condition remains true to this day regarding the greater part of the collections of continental Europe. When we examined the collection at Berlin in 1898 it contained only a single American specimen of *Botrychium lanceolatum* and that from Greenland, and not a single specimen of *B. neglectum*. Milde's collection was scarcely better, to judge it by his own citations, and the futility of relying on opinions based on such meagre data becomes clearly apparent when we know

* Verhändl. k. k. zool.-bot. Gesell. Wien. 18: 507-516. 1868.

the real facts in the case. We mention this because we have had in this country in certain quarters too much of the now obsolete notion that "the Europeans have told us better" concerning the status of our own species. Milde recognized only ten species in 1870. Prantl* enumerated the species known to him in 1884, and although he was familiar with the principal German collections only, he still recognized fifteen species. Against these more rational estimates, the English botanists even in their latest pronouncement† can find only six species! The present list enumerates thirty-four species whose status is quite definitely known, and four others concerning which there are no materials for verification that have been accessible up to the present time. Besides the above there is material at Kew and Berlin representing certainly one and possibly two additional species of the *ternatum* group from South America, and perhaps a third from Central America. This material can best await further study before publication. There is also evidence of a species of the *simplex* group in California that awaits further study afield.

LIST OF THE KNOWN SPECIES OF BOTRYCHIUM

Species accepted as valid are in SMALL CAPITALS, except those herein described as new, which are in the usual **bold-faced type**. Species regarded as synonyms of other species are in *italics* with their proper equivalents. Species of uncertain standing owing to inaccessibility of types or other causes are also in *italics*, but with no equivalents indicated.

Botrychium anthemoides Presl = ? *B. VIRGINIANUM*.

Milde comments on this species in his paper on the Silesian ferns and gives a figure of Presl's specimen, but unfortunately gives two numbers alike on the plate, so as to leave one in doubt concerning just which is the one intended for Presl's plant. There is, however, little doubt but that the species was based on an aborted specimen of the European form of our familiar species.

BOTRYCHIUM AUSTRALE R. Br., Prodr. Fl. Nov. Holl. 164. 1810.

—Australia, Tasmania, New Zealand.

Botrychium Baeckeanum Brockm. Archiv. Ver. Freund. Naturg. Mecklenburg, 170. 1863.—Description not seen; said by Milde to belong to *B. matricariae*.

* Jahrb. Bot. Gartens Berlin, 3 : 297-350. 1884.

† Annals Bot. 5 : 500. 1891.

BOTRYCHIUM BIFORME Colenso, Trans. New Zeal. Inst. **18**: 223. 1886.—New Zealand.

BOTRYCHIUM BITERNATUM (Lam.) Underw. Bot. Gazette, **22**: 407. *pl.* 21. 1896.

Osmunda biternata Lam. Encyc. Meth. Bot. **4**: 650. 1797.

Botrypus lunarioides Rich.; Michx. Fl. Bor. Am. **2**: 274. 1803.

Botrychium lunarioides Sw. Syn. Fil. 172. 1806.

Botrychium fumarioides Willd. Sp. Pl. **5**: 63. 1810.

Botrychium fumariae Spreng. Syst. Veg. **4**: 23. 1827.

South Carolina, Georgia, Florida, Alabama, Louisiana.

BOTRYCHIUM BOREALE Milde, Bot. Zeitung, **15**: 880. 1857.—Scandinavia, Northern Asia, Alaska.

Botrychium brachystachys Kunze = B. VIRGINIANUM MEXICANUM.

Botrychium brevifolium Ångstr. Bot. Notiser, 40. 1866.—Plant not known. Description even not yet seen and the plant was unknown to Milde.

Botrychium Breynii Fries = B. MATRICARIAE.

BOTRYCHIUM CHAMAECONIUM Bitter & Hieron.; E. & P. Nat. Pflanzenf. **1**⁴: 471. 1900.—Africa (Kamerun).

BOTRYCHIUM CICUTARIUM Sw. Syn. Fil. 171. 1806.—Santo Domingo.

This species was based on Plumier, *pl.* 159, from Santo Domingo. Later writers have confused various species with it, as J. D. Hooker,* who applied the name to a New Zealand species of the *ternatum* group! Moore made it a sub-species of *B. Virginianum*. To this day, however, no specimens of *Botrychium* have been collected in Santo Domingo to our knowledge, and until that *terra incognita* is made known to us botanically it is best to leave the species in abeyance.

BOTRYCHIUM COULTERI Underw. Bull. Torrey Club, **25**: 537. 1898.—Yellowstone National Park, Montana, Wyoming, Idaho.

BOTRYCHIUM CRASSINERVIVM Rupr.; Milde, Nov. Act. Acad. Caes. Leop. Carol. **26**: 763. *pl.* 55. *f.* 10, 11. 1858.—Siberia.

Botrychium cuneatum Desv. = B. OBLIQUUM.

BOTRYCHIUM DAUCIFOLIUM Hook. & Grev. Ic. Fil. **2**: *pl.* 161. 1831.

* Handb. New Zeal. Fl. 387. 1867.

Botrychium subcarnosum Wall. Cat. no. 49 (*nomen nudum*);

Hook. & Grev. Bot. Misc. 3: 222. 1833.

India, Burma, Society Islands?, Samoa?.

Botrychium daucifolium β *Japonicum* Prantl = B. JAPONICUM.

BOTRYCHIUM DECOMPOSITUM Mart. & Gal. Mem. Acad. Sci.

Bruxelles, 15:—(15). *pl.* 1. 1842. — Mexico.

Botrychium dichronum sp. nov.

A moderately tall plant, allied to *B. Virginianum*, with sessile sterile lamina and persistent leaf of the preceding year. Roots fleshy: stem 15–20 cm. long, smooth: sterile lamina broadly triangular, 20 cm. wide, 15 cm. long, tripinnatifid with about five pairs of nearly opposite gradually diminishing pinnae, the lowermost with longer pinnules on the outer side and inclined forward at an angle; pinnules 8–10 on each side of a winged rachis, alternate, cut nearly to the midrib into 6–10 segments set at an angle of 45° with the rachis, the lower ones slightly narrowed at the base, and 3–5-toothed at the apex, all gradually simpler towards the apex of the lamina: panicle* triangular, spreading, 3 cm. or more long on a slender stalk 4 cm. or more long, 2–3-pinnate.

JAMAICA: Morce's Gap, altitude 1500 m., 7 Feb. 1900. *W. N. Clute*, 96. (Type in herb. Underwood.)

This plant was distributed as *B. Virginianum* with which it had been previously confounded and which it resembles rather closely, but differs in its peculiar short panicle, in the cutting of the lamina, and especially in its persistent sterile leaf which remains fresh until the new one is fully developed, the plant thus having two growing leaves at the time of maturity to which allusion is made in the specific name. This peculiar habit has been mentioned by both Jenman and Clute, who appear to be the only persons who have reported it from Jamaica. Its seasonal appearance also is peculiar.

BOTRYCHIUM DISSECTUM Spreng. Anleit. 3: 172. 1804.

Botrychium ternatum, var. *dissectum* D. C. Eaton, Ferns N.

A. 1: 150. *pl.* 20. *f.* 1. 1878.

New England to Virginia, Ohio, Indiana and Kentucky.

While this species undoubtedly approaches in some of its forms to *B. obliquum*, we have yet to see a specimen that could not readily

* On the type specimen the sporophyll is not quite mature and the measurements may be a trifle too small for an average mature plant.

be distinguished in the herbarium even when shriveled by drying ; in the field it often grows in the same localities as *B. obliquum* and there can always be distinguished at a glance. When it grows in the open sun it often becomes contracted and compact in habit, but the typical form of the species is so unlike *B. obliquum* that it is more rational to consider it a distinct species. (Cf. observations under *B. ternatum*.)

Botrychium erosum Milde, Bot. Zeitung, **22**: 102. 1864.

(Type from Auckland, New Zealand, *Hay*; in herb. k. k. Hofmuseum, Vienna). Milde later referred this species to his all-embracing *B. ternatum*, but this reference signifies nothing in this day of more rational conceptions of geographic distribution ; without having seen the type it seems best to leave the species in doubt though it may be one of the forms of the Australasian *B. australe*.

Botrychium fumariae Spreng. = *B. BITERNATUM*.

Botrychium fumarioides Willd. = *B. BITERNATUM*.

Botrychium gracile Pursh = *B. VIRGINIANUM*.

BOTRYCHIUM JAPONICUM (Prantl) Underw. Bull. Torrey Club, **25**: 538. 1898.

Botrychium daucifolium β *Japonicum* Prantl, Jahrb. Bot. Gartens Berlin, **3**: 340. 1884.

Japan.

BOTRYCHIUM JENMANI Underw. Fern. Bull. **8**: 59. 1900.—
Jamaica.

Botrychium Kannenbergii Klinsman = *B. SIMPLEX*.

BOTRYCHIUM LANCEOLATUM (S. G. Gmel.) Ångstr. Bot. Notiser, **68**. 1854.

Osmunda lanceolata S. G. Gmel. Nov. Comm. Acad. Sci. Petrop. **12**: 516. *pl. 11. f. 2.* 1768.

Botrychium palmatum Presl, Suppl. Tent. Pterid. 43. 1845.

Scandinavia, Siberia, Alaska, to Washington, eastward to Greenland, Labrador and Newfoundland and southward to Colorado, Michigan and Pennsylvania.

BOTRYCHIUM LANUGINOSUM Wall. Cat. 48 (*nomen nudum*); Hook. & Grev. Ic. Fil. **1**: *pl. 79. (pl. jun.)* 1831. — India.

BOTRYCHIUM LUNARIA (L.) Sw. Schrader's Jour. Bot. **1800**²: 110. 1801.

Osmunda Lunaria L. Sp. Pl. 1064. 1753.

Europe, Northern Asia, Newfoundland, Labrador, Minnesota, Colorado, Utah, and northward to Alaska and Greenland.

Botrychium lunarioides (Rich.) Sw. = *B. BITERNATUM*.

BOTRYCHIUM MATRICARIAE (Schränk) Spreng. Syst. Veg. 4: 23. 1827.

Osmunda matricariae Schrank, Baier. Fl. 2: 419. 1789.

Botrychium rutaceum Sw. Schrader's Jour. Bot. 1800²: 110. 1801.

Botrychium matricarioides Willd. Sp. Pl. 5: 62. 1810.

Botrychium rutaefolium A. Br.; Döll. Rhein. Fl. 24. 1843.

Botrychium Breynii Fries, Summa Veg. Scand. 252. 1846.

? *Botrychium Baeckeanum* Brockm. (*fide* Milde).

Northern Europe, Labrador, Quebec, New Brunswick, Maine, New Hampshire?, Vermont, New York.

Botrychium matricariaefolium A. Br. = *B. RAMOSUM*.

Botrychium matricarioides Willd. = *B. MATRICARIAE*.

BOTRYCHIUM NEGLECTUM Wood, Class Book Botany, [ed. 3.] 816. 1860. — Nova Scotia to Maryland, Ohio and northward; also in South Dakota, Alaska, British Columbia, and Washington?

BOTRYCHIUM OBLIQUUM Mühl.; Willd. Sp. Pl. 5: 62. 1810.

Botrychium cuneatum Desv. Ann. Soc. Linn. Paris, 6: 195. 1827.

Botrychium ternatum var. *obliquum* D. C. Eaton, Ferns N. A. 1: 149. pl. 20. f. 2. 1878.

New Brunswick to Georgia, Indiana and Minnesota.

BOTRYCHIUM OBLIQUUM INTERMEDIUM Underw. Our Native Ferns, ed. 6, 72. 1900.

Botrychium ternatum, var. *australe*, sub-var. *intermedium* D. C. Eaton, Ferns N. A. 1: 149. pl. 20a (*front figure only*). 1879.

New England, New York and northward. The relations of this perplexing form and its distribution are still unsettled questions.

BOTRYCHIUM OCCIDENTALE Underw. Bull. Torrey Club, 25: 538. 1898. — British Columbia, Washington.

***Botrychium Onondagense* sp. nov.**

A slender species somewhat intermediate between *B. Lunaria* and *B. tenebrosum* with distant wedge-shaped segments. Roots

slender from a very short axis: common stalk slender, rather weak and spreading, 8–12 cm. long: lamina short-stalked (about 1 cm.), 2–4 cm. long, 1–1.5 cm. wide, composed of 7–9 broadly cuneate segments which are spaced their own width or more, with one or more notches in the outer margin, or occasionally quite deeply incised: sporophyll 1.5–2.5 cm. long, mostly bipinnate, with a slender stalk 2.5–4 cm. long.

Rocky ground in shade. The following specimens have been examined: "Geddes Farm," Syracuse, 1879, *J. S. Gifford*, C D *; Syracuse, 1873, *E. W. Mundy*, G; Jamesville Road, 1878, *Mary Olivia Rust*, U C D K E; near Split Rock, Syracuse, *Underwood* (type), U. All the stations are within five miles from Syracuse in Onondaga county, New York, where the writer first commenced the study of ferns in 1875, and to the memory of which as one of the most prolific fern localities in the country this species is dedicated. Similar plants have been collected in Michigan near Copper Harbor, Keweenaw Point, *O. A. Farwell*, U; and in Montana, Box Elder Creek, 23 July 1886, *R. S. Williams*, E.

This interesting species was originally discovered by the ladies of the Syracuse Botanical Club in June 1872; there appears to have been some difference of opinion as to whom the original discovery belongs as it was claimed by both Mrs. S. M. Rust and Miss Jane Hosmer. Mr. Davenport was the first to determine the plant and naturally confused it with the more robust *B. Lunaria* and as early as 1877 published an account of it under that name. That it may be a descendant of the stock from which *B. Lunaria* sprang, is possible, but it also has very striking relations with *B. tenebrosum*. Having collected this rare species in one of its central New York stations and being familiar with the European *B. Lunaria* not only in the herbarium but from considerable field study, we have long regarded this a distinct species, and have waited in vain for additional information before publication. We have carefully gone over the extensive suites of specimens of *B. Lunaria* in the large herbaria at Kew, Berlin, and Paris and find nothing to match this slender plant from central New York. The

* [As noted in previous papers by Professor Underwood, published in the BULLETIN, these letters refer to the herbaria in which the specimens noted have been seen: B = Berlin; C = Columbia (and the N. Y. Botanical Garden); D = Davenport; E = D. C. Eaton; G = Gray; K = Kew; and U = Underwood.—ED.]



more slender habit, and the distant cuneate segments will readily distinguish it from *B. Lunaria*. The European species also occurs in British America and Alaska and in the high mountains of Colorado. The smaller species of this genus present as close a series as the much larger *ternatum* group and should receive more thorough field study. In this species the leaf is rarely quite short-stalked and in one or two specimens seen the number of segments is abnormally increased to fifteen. On the whole, the plant is rather nearer *B. tenebrosum*, but differs in its broader cuneate segments which are entire or flabellately lobed. In its habitat in rocky woods it is quite unlike *B. Lunaria* of Europe, which commonly grows in open meadows.

Botrychium palmatum Presl = *B. LANCEOLATUM*.

BOTRYCHUM PUMICOLA Coville; Underw. Our Native Ferns, ed.

6. 69. 1900; Bull. Torrey Club, 28: 109. *pl.* 7. 1901.—
Oregon.

***Botrychium pusillum* sp. nov.**

A low plant related to *B. matricariae*, branching below the surface of the ground and bearing small ternately compound leaves. Stem 1 cm. long (rarely longer when growing deeply), buried, pale: leaves about 3 cm. wide by 2.5 cm. long, on a short petiole 1–1.5 cm. long, the lateral divisions tripinnatifid, the terminal scarcely exceeding the lateral, the ultimate segments closely placed, rounded, wider and sometimes lobed above, 2.5–3 mm. broad, with entire margins; texture fleshy; veins imperceptible: sporophylls 4–8 cm. long (including the stout stalk), the panicle tripinnate, 3–5 cm. long.

MEXICO: Wet meadows, Sierra de las Cruces, State of Mexico, 3000 m., 11 Sept. 1892, *Pringle*, 5192. (Type in herb. Underwood.)

Differs from *B. biternatum* in its seasonal development, being autumnal instead of vernal, in its stalked leaves, and its more compact fleshy entire segments. Related more nearly to *B. matricariae* in size, but differing in its stouter form, its entire segments, and its concealed veins.

BOTRYCHUM RAMOSUM (Roth) Ascherson, Fl. Brand. 1: 906. 1864.

Osmunda ramosa Roth, Fl. Germ. 1: 444. 1788.

Botrychium matricariaefolium A. Br.; Döll. Rhein. Fl. 24.

1843. (As synonym.)

Botrychium Reuteri Payot, Cat. Foug. 15. 1860.

Northern Europe. Early figured by Breyne, and differing entirely both in habit and structure from its American congener which has been confused with it.

Botrychium Reuteri Payot = *B. RAMOSUM*.

***Botrychium robustum* (Rupr.).**

Botrychium rutaefolium var. *robustum* Rupr.; Milde, Nov. Act.

Acad. Caes. Leop.-Carol. 26: 763. *pl.* 55. *f.* 9. 1858.

Kamtschatka, Unalaska.

Botrychium rutaceum Sw. = *B. MATRICARIAE*.

Botrychium rutaefolium A. Br. = *B. MATRICARIAE*.

***Botrychium Schaffneri* sp. nov.**

A stout fleshy plant allied to *B. obliquum* with somewhat compact glaucous foliage and copious elongated sporophylls. Stems 2–5 cm. long, stout, fleshy: leaves 10–18 cm. wide by 6–11 cm. long, on slender petioles 5–6 or rarely up to 10 cm. long; lateral divisions rather long-stalked, tripinnate; the terminal larger, sometimes quadripinnatifid below; ultimate segments oval or rarely lobed and slightly narrowed below, the margins entire, the rachises broadly winged, the surfaces bluish glaucous: sporophylls 20–35 cm. or more long on stout stalks, the panicles 6–12 cm. or more long, quadripinnate.

MEXICO: "In montibus prope San Luis Potosi," Oct. 1879, *Schaffner*, U (type) K; San Miquelito Gebirge (San Luis Potosi), *Schaffner*, 25, C (numerous specimens); Valle de Mexico, 1875, *Schaffner*, B.

The plant is considerably smaller, more fleshy and glaucous than *B. decompositum* and is correspondingly more compact in growth and has usually shorter petioles. It is much more finely divided than either that species or *B. obliquum* to which it is somewhat related. I take pleasure in naming the species after its sole collector, Dr. Schaffner, who sent me fine specimens over twenty years ago, shortly before his death.

BOTRYCHIUM SILAIFOLIUM Presl. Rel. Haenk. 1: 76. 1825.—
California and northward.

Botrychium Silesiacum Kirschlg. Fl. Alsac. 401. 1855. Not known and description not seen.

BOTRYCHIUM SIMPLEX Hitchc. Am. Jour. Sci. 6: 103. *pl.* 8. 1823.

Botrychium Kannenbergii Klinsman, Bot. Zeitung, 10: 378.

1852.

New England, New York, New Jersey, Pennsylvania, ? Wyoming ; Northern Europe.

Botrychium strictum sp. nov.

A tall plant with the habit of *B. Virginianum* with a sessile sterile lamina and slender spicate panicle. Roots fleshy : stems 25 cm. or more long, slender, with slightly fibrillose covering : sterile leaf broadly triangular, sessile, of three equal or subequal 2-3 pinnatifid divisions ; primary pinnae 6-10 cm. long, strongly decurrent on the rachis, with 8-10 pinnules on each side which vary from oblong-lanceolate to lanceolate ; pinnules varying from deeply 4-5-crenate to 5-cleft on each side, blunt or rounded at the end : panicle 6-13 cm. long, on a slender stalk 5-6 cm. long, with 16-20 short compact branches 5-15 mm. long, placed at an acute angle with the axis, thus causing the entire panicle to appear spike-like : sporangia much crowded, large, nearly 1 mm. in diameter : spores pale yellow.

JAPAN : Sapporo in groves, Aug. 1894, *A. W. Stanford* (type in the herbarium of the New York Botanical Garden) ; "in sylvis Takaosan., prov. Musashi, 10 Oct. 1885" comm. J. Matsamura, U. I have also seen a specimen in the Museum of the *Jardin des Plantes* at Paris, and one in the herbarium of Mr. B. D. Gilbert. The species has hitherto been reported from Japan under the name of *B. Virginianum* but it is clearly a very distinct species, differing widely in the cutting of the leaf and in the narrow spike-like panicle which is also much shorter than in our familiar species. In the new species the mature panicle scarcely overtops the sterile leaf when laid on the herbarium sheet.

BOTRYCHUM SUBBIFOLIATUM Brack. U. S. Expl. Exped. 16 : 317.

pl. 44. f. 2. 1854. — Sandwich Islands.

Botrychium subcarnosum Hook. & Grev. = *B. DAUCIFOLIUM*.

BOTRYCHUM TENEBROSUM A. A. Eaton, Fern Bull. 7 : 8. 1899. —

New Hampshire, Vermont, Connecticut, New York.

Botrychium tenellum Ångstr. Bot. Notiser, = *B. RAMOSUM* (*pl. jun.*).

Botrychium tenuifolium sp. nov.

A slender-stemmed species allied to *B. obliquum* but with the segments thin and reduced to nine in number. Stem very slender, 2-4 cm. long, 1-1.5 mm. thick : leaf 3.5-5 cm. long, 3-6 cm. wide, usually consisting of only nine segments (*i. e.*, strictly biterminate), with the three divisions subequal ; occasionally larger forms show a pair of additional lobes on the terminal division ; segments

ovate, 1.2–15 cm. long by 6–8 mm. wide, thin, sharply serrate, or in larger forms occasionally two or three times incised; petiole 3–6.5 cm. long, very slender; panicle 3–6 cm. long, bipinnate or rarely tripinnate below, on a slender stalk 6–22 cm. (usually 12–14 cm.) long.

Specimens have been examined as follows:

LOUISIANA: Alexandria, *Hale* (Chapman herbarium), C (type).

FLORIDA: "River banks," C. Communicated many years ago to Torrey who had endorsed it: "Seems to come near *B. simplex* Hitch."

ALABAMA: Auburn, 1895, *Underwood*, U; 15 Oct. 1896, *Earle*, C; 22 Oct. 1896, *C. F. Baker*, C; Oct. 1897, *Baker & Earle*, C.

MISSOURI: Butler county, 4 Nov. 1892, *Bush*, C.

This species is nearest related to *B. obliquum* which it appears to replace in the coastal plain of the gulf region. It is much more slender than *B. obliquum* and the leaf is not only much less divided in mature forms, but is also thinner and usually sharply serrate almost as in *B. japonicum*. Typical forms have only nine segments to the leaf.

BOTRYCHIUM TERNATUM (Thunb.) Sw. Schrader's Jour. Bot. 1800²:

III. 1801.

Osmunda ternata Thunb. Fl. Jap. 329. *pl.* 32. 1784.

Japan, China, India.

A number of species were referred to this species as varieties by Milde, and the practice is still followed by some of his modern admirers. There seems to be no difference of opinion relative to the existence of the groups of individuals as distinct groups, the only difference appearing to be the rank that shall be assigned to them. The *ternatum* group represents a closely allied group of forms that appear to have become widely scattered from some common center. There is no rational doubt but that they have had a common origin; this of course is the only possible explanation of their structural and habital relationship. Now where was the original center from which they sprung? According to the system that would make them varieties of *B. ternatum* because that species *happened* to be the first described, it would seem to follow that that centre was in Japan, otherwise they could not be varieties of a Japanese species. The current system of naming varieties is a stupid

practice handed down to us from the past and is wholly at variance with the modern conceptions of evolution. The original centre in all probability was *not* in Japan so that the members of the *ternatum* group are not varieties sprung from *B. ternatum*, and it creates a false impression to continue to call them so. They are distinct *things* as everyone admits, and we maintain it is more rational and more in accord with our conceptions of evolutionary origin from a common stock to call them species. It is also much simpler and leaves us free to determine the original centre of distribution and relationship without prejudice. The practice of naming varieties on slight environmental characters ought to cease, and botanists should discourage the naming of such trivialities. A marked example of how far this reduction of species to varieties can be carried is seen in Dr. Christ's reduction of *Dryopteris marginalis* and *D. Goldieana* to varieties of *D. filix-mas*. For a European who has never seen either of the species growing in its native habitat to take such liberties with American species is to say the least violating the code of international courtesy and ought to stand as a warning to those who still hold to the ancient heresy that Europeans know more about the American flora than we do ourselves.

BOTRYCHIUM VIRGINIANUM (L.) Sw. Schrader's Jour. Bot. 1800²:

III. 1801.

Osmunda Virginiana L. Sp. Pl. 1064. 1753.

Botrychium gracile Pursh, Fl. Am. Sept. 2: 656. 1814.

Botrychium anthemoides Presl, Abh. Böhm. Ges. Wiss. 5: 323. 1847.

BOTRYCHIUM VIRGINIANUM MEXICANUM Hook. & Grev. Bot. Misc. 3: 222. 1833.

Botrychium brachystachys Kunze, Linnaea, 18: 305. 1844.

Mexico. Moore referred this to *B. cicutarium*, which he made a subspecies of *B. Virginianum*. The species or variety appears to be quite rare in collections although Mr. Pringle once wrote me that it was quite common in Mexico. It is desirable that it be compared in the field with more northeastern types of the species. The region of Mexico has been widely traversed by Mr. Pringle and others who have brought to light a large number of new species, but they have almost as systematically neglected to collect the old ones, and consequently our knowledge of the distribution of

Mexican plants is still lamentably defective. The whole Mexican region will have to be gone over piecemeal, and collections made that will give some conceptions of the distribution of many of the species of that prolific country. Among them is this Mexican representative of our common rattlesnake fern of which scarcely any specimens exist in American collections.

[The figures on page 49 illustrate four species: *f. 1, 2 = Botrychium Onondagense*; *f. 3 = Botrychium Lunaria*; *f. 4, 5 = Botrychium neglectum*; *f. 6, 7 = Botrychium tenebrosum*.]

COLUMBIA UNIVERSITY,
25 December 1902.